

Governor's Water Augmentation, Innovation, and Conservation Council Post-2025 AMAs Committee September 9, 2021



Agenda

- I. Welcome – Cheryl Lombard and Warren Tenney, Committee Co-Chairs
- II. Presentations on Hydrologic Disconnect
 - I. ADWR – Jenna Norris, Governor’s Water Council Coordinator
 - II. Salt River Project – Christa McJunkin, Director of Water Strategy
 - III. Central Arizona Groundwater Replenishment District – Viviane Baji, Planning Analyst
- III. Discussion of Potential Concepts to Address Hydrologic Disconnect
- IV. Next Steps
- V. Adjournment



Webinar Logistics

- Please state your name when speaking.
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- The meeting and chat will be recorded.

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I. Welcome



Cheryl Lombard and Warren Tenney
Post-2025 Active Management Areas
Committee Co-Chairs

An aerial photograph showing a vast landscape of agricultural fields in various shades of green and brown, separated by a network of roads and a multi-lane highway. In the far distance, a range of mountains is visible under a clear sky. A semi-transparent circular overlay is positioned on the left side of the image, containing the title and list.

Timeline

Presentations plus Discussion of Ideas

- June 22nd – Groundwater in the Assured Water Supply Program
- August 10th – Unreplenished Groundwater Withdrawals
- September 9th – Hydrologic Disconnect
- GWAICC September 16th – Committee Update

Timeline

- October through December – Fine-tune most realistic, supported strategies and solutions
- GWAICC December 9th – Present general-consensus proposals
- 2022 – Continue discussion to develop additional strategies and solutions

II. Hydrologic Disconnect



*Jenna Norris, Governor's Water Council Coordinator
Arizona Department of Water Resources*

*Christa McJunkin, Director of Water Strategy
Salt River Project*

*Viviane Baji, Planning Analyst
Central Arizona Groundwater Replenishment District*

Introduction

When qualified water supplies are stored underground within an AMA those supplies can be recovered within the same calendar year via annual storage and recovery (AS&R) or, with certain exceptions, they can generate long-term storage credits (LTSC) for recovery in future years.



What is the Hydrologic Disconnect?

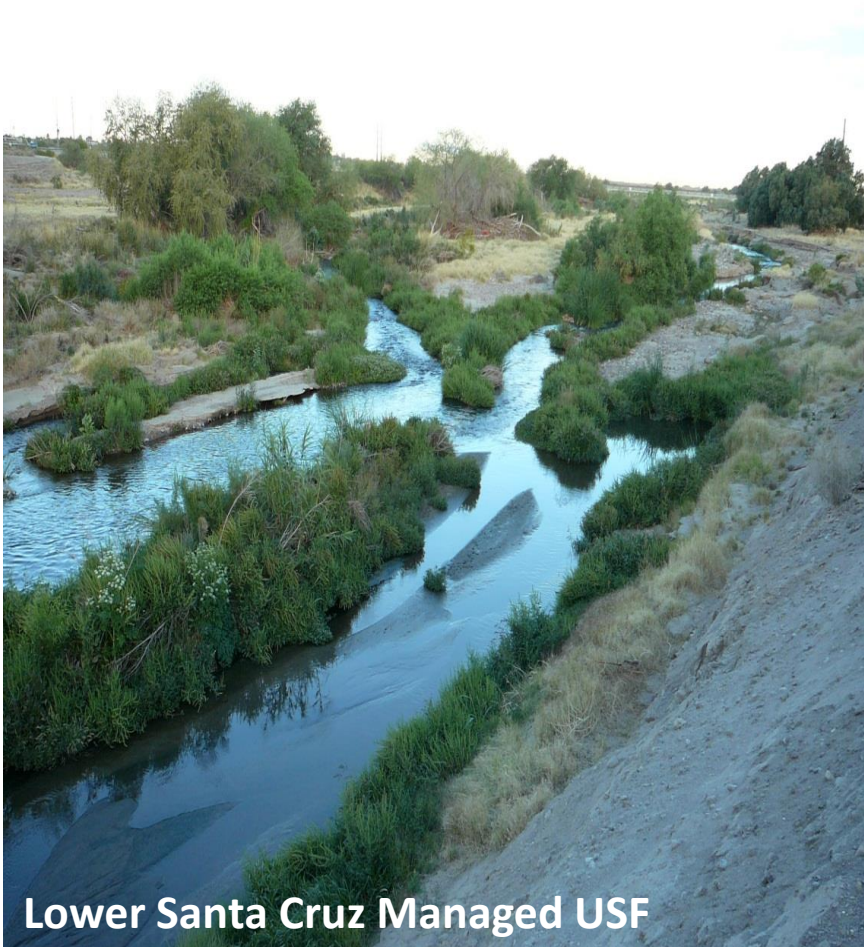
Hydrologic Disconnect*: The ability to legally recover or replenish water that was respectively stored or pumped in a different location.

Pursuant to A.R.S. § 45-834.01 , a person who holds long-term storage credits or who stores water on an annual basis may recover the water stored pursuant to a water storage permit if:

1. the well is permitted for recovery
2. the well is located **within the area of impact of the stored water; OR**
3. the recovery well is located **outside the area of impact of the stored water and certain additional criteria are met.**



Area of Impact



Lower Santa Cruz Managed USF

Area of Impact (AOI) for an **Underground Storage Facility (USF)**:

1. the area contained within the 1-mile buffer of the facility (“the 1-mile safe harbor”) OR;
2. the area of hydrologic impact (AOHI)

Area of Impact (AOI) for a **Groundwater Savings Facility (GSF)**:

1. the area contained within the exterior boundary of the GSF

Recovery Outside the Area of Impact

Recovery that will occur **outside the Area of Impact (AOI) of the stored water** must be consistent with the Management Plan Storage and Recovery Siting Criteria. Two of the three criteria require that:

1. At the time of the application, the maximum projected depth to water at the location of the recovery well **after 100 years does not exceed the general 100-year depth-to-static water level** for the active management area specified by A.A.C. R12-15-716
2. The recovery well is in an area experiencing an average annual rate of groundwater decline that is **less than 4.0 feet per year.**



Differences between Annual vs. LTSC Recovery

Annual Recovery:

1. Decreed and Appropriative (D&N) surface water supplies (Salt & Verde river water, etc.) must be stored and recovered within the same month.

Therefore, all surface water storage and recovery is accounted for as AS&R*.

2. Annual storage and recovery is not subject to a cut to the aquifer*.

Long-Term Storage Credits:

1. Typically, with some exceptions, there is a 5% cut to the aquifer for water stored at a recharge facility, which is intended to provide a general benefit to the aquifer from the recharge activity.



Scale of Recovery and Storage for All AMAs

Cumulative (1989-2017)

Annual Recovery for All AMAS = ~2,700,000 AF

Long-Term Storage Credits Recovered = ~450,000 AF

Wet Water Delivered = ~15,000,000 AF

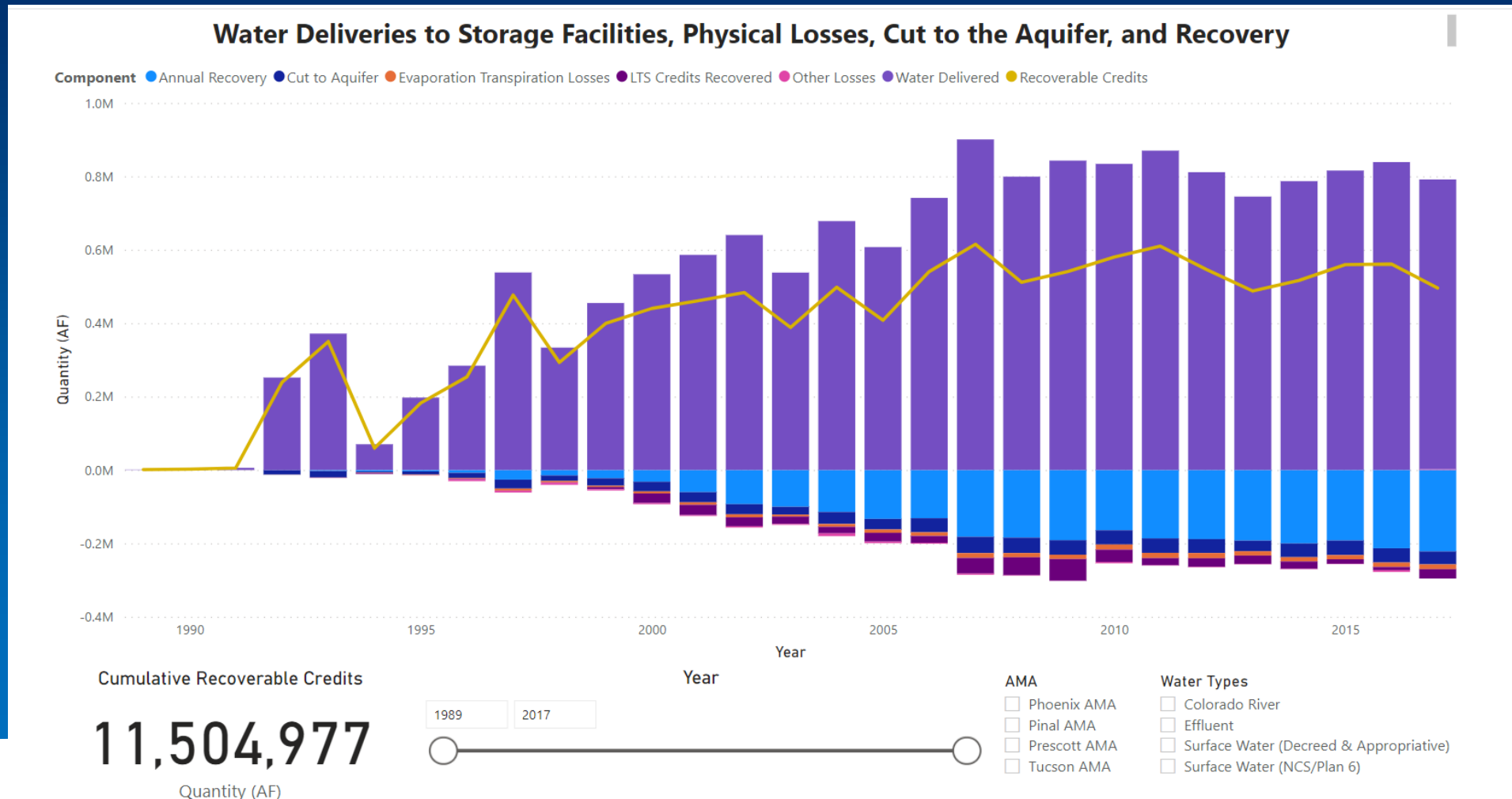
Available LTSC for Recovery = ~11,500,000 AF

~85% of Recovery has been AS&R

~20% of Water Delivered has
been recovered



Data Dashboard (linked)



Thank you! Questions?

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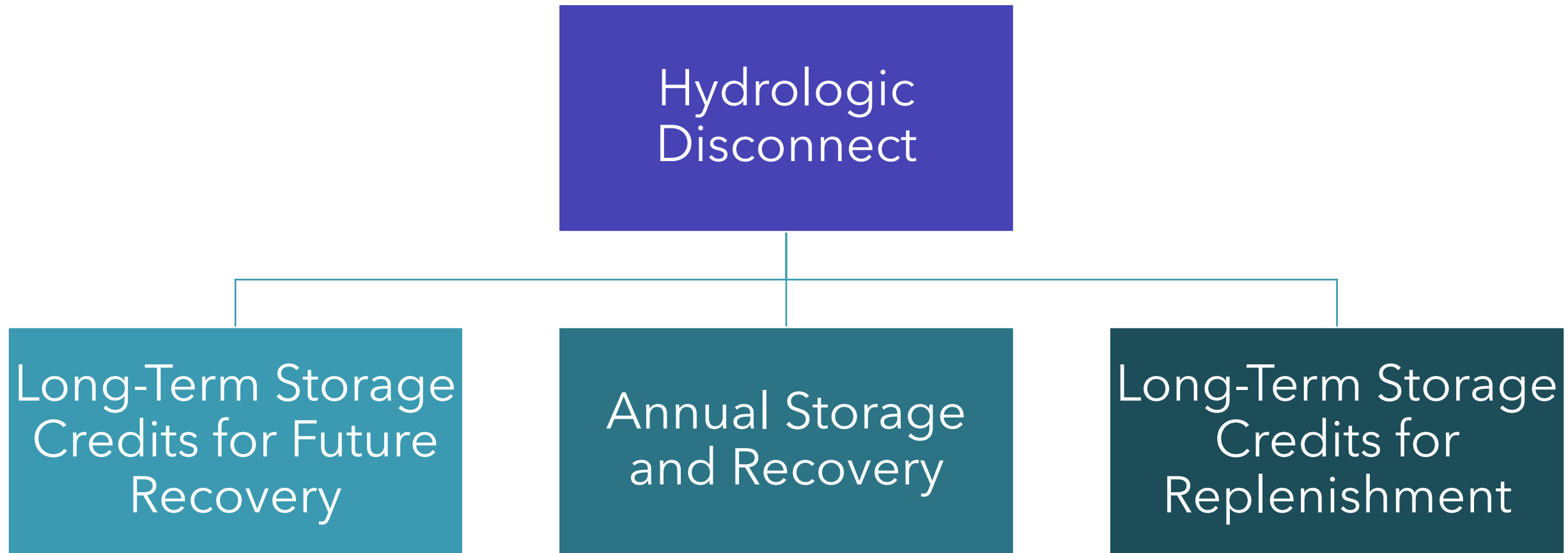
**PROTECTING
ARIZONA'S WATER SUPPLIES**
for ITS NEXT CENTURY

Website:
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Twitter: @azwater

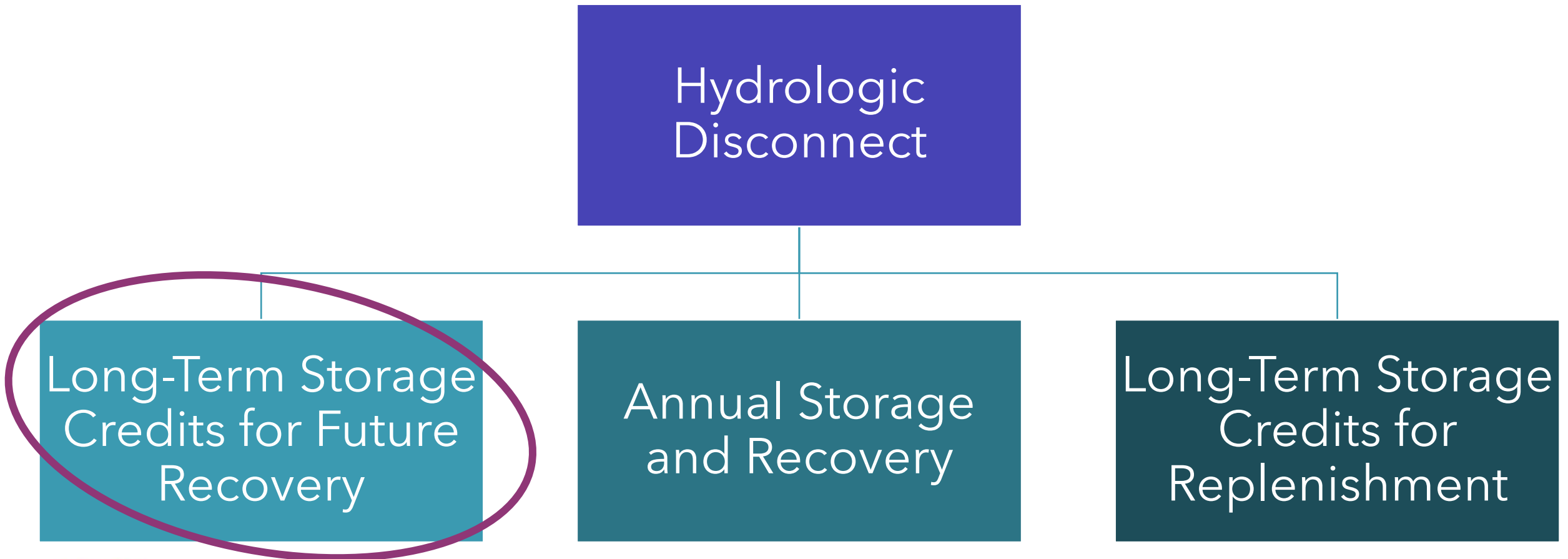
Analysis of Long-Term Storage Credits in the Phoenix AMA

A Three-Pronged Approach at Evaluating the Hydrologic Disconnect
Between Water Storage and Recovery

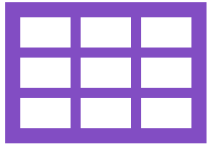
The Three Components of Hydrologic Disconnect



The Three Components of Hydrologic Disconnect



Objectives



Part 1

Analyze Long-term Storage Credit (LTSC) locations within Phoenix AMA



Part 2

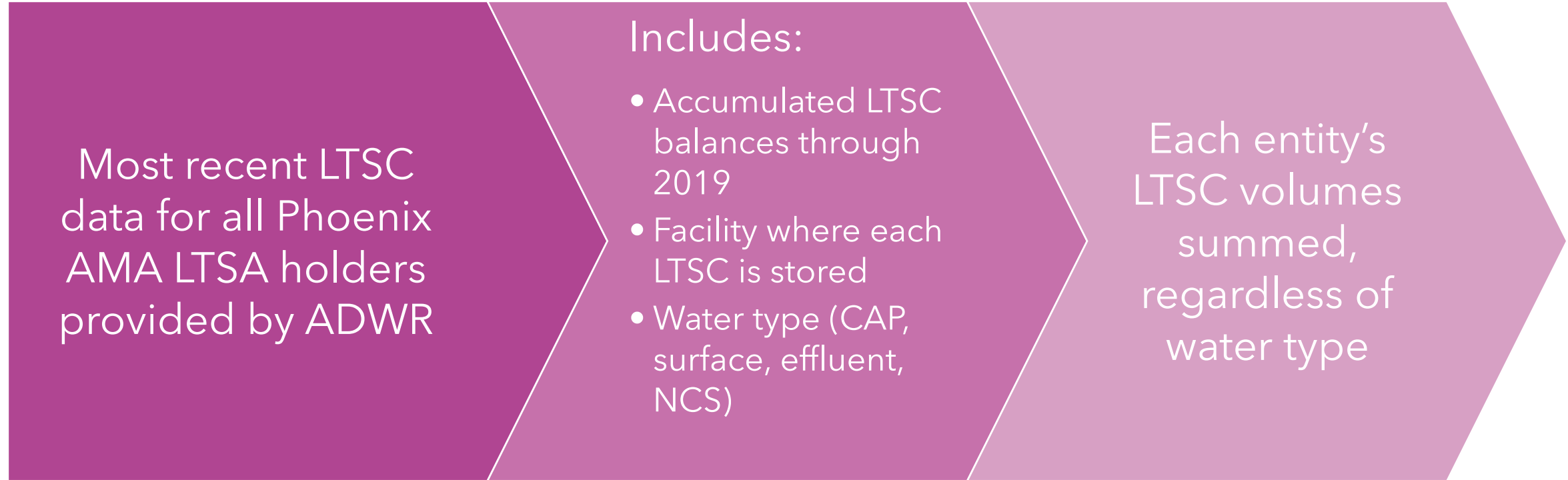
Determine the extent of hydrologic disconnect between LTSC location and probable recovery location



Part 3

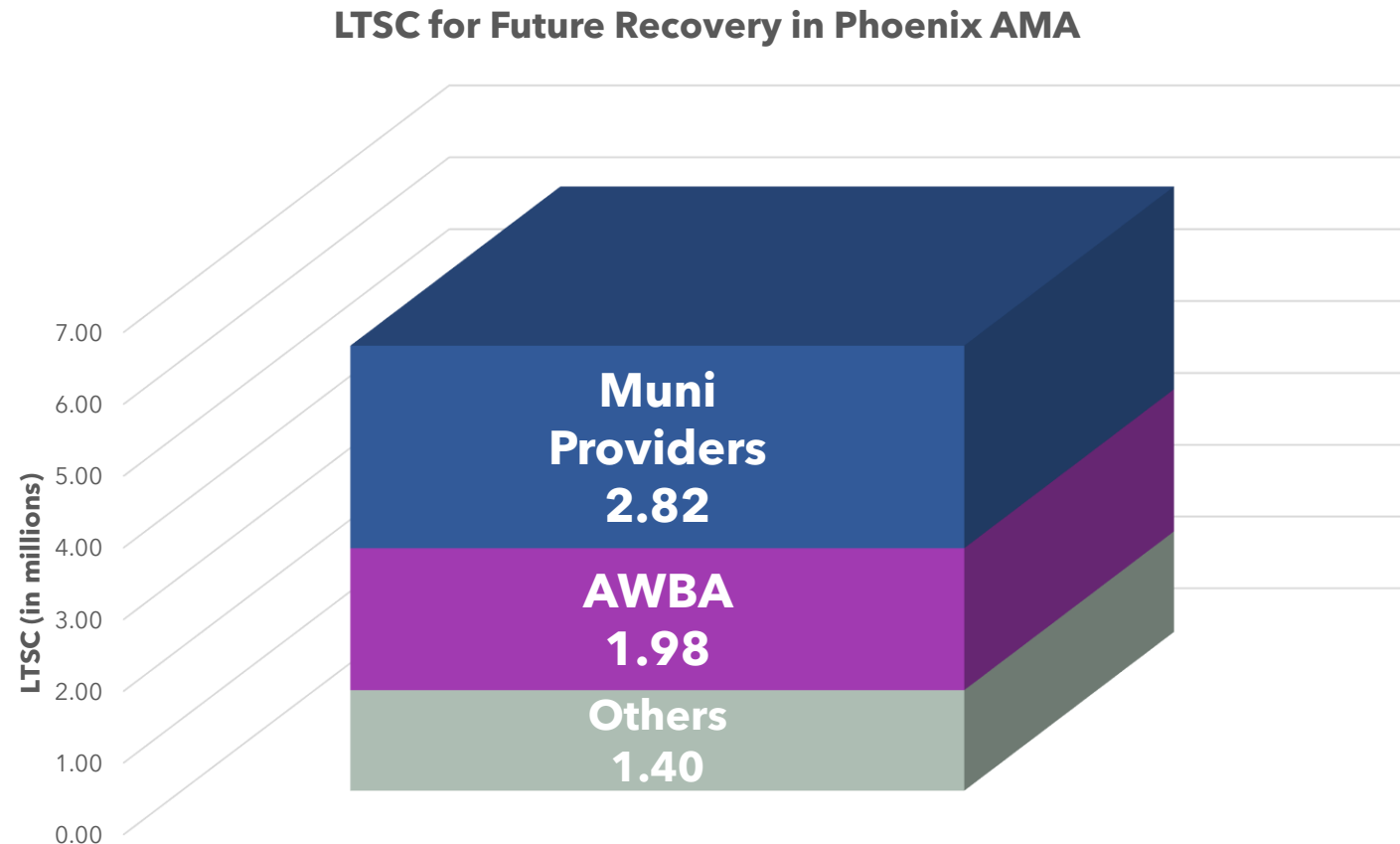
Propose potential solutions for LTSC stored in less desirable locations

Part 1 - Analysis of LTSC holders within Phoenix AMA

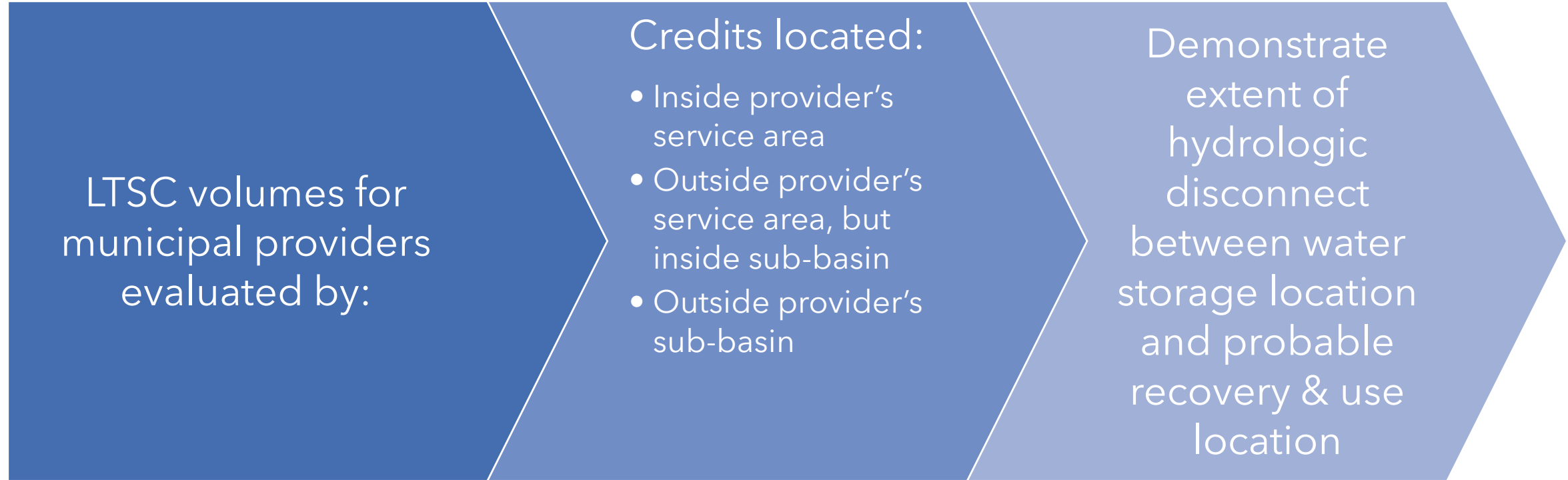


Part 1 - Analysis of LTSC for Future Recovery in Phoenix AMA

More than 6.2M
LTSC for future
recovery remain
in storage in the
Phoenix AMA



Part 2 - Analysis of Municipal Providers' LTSC Locations

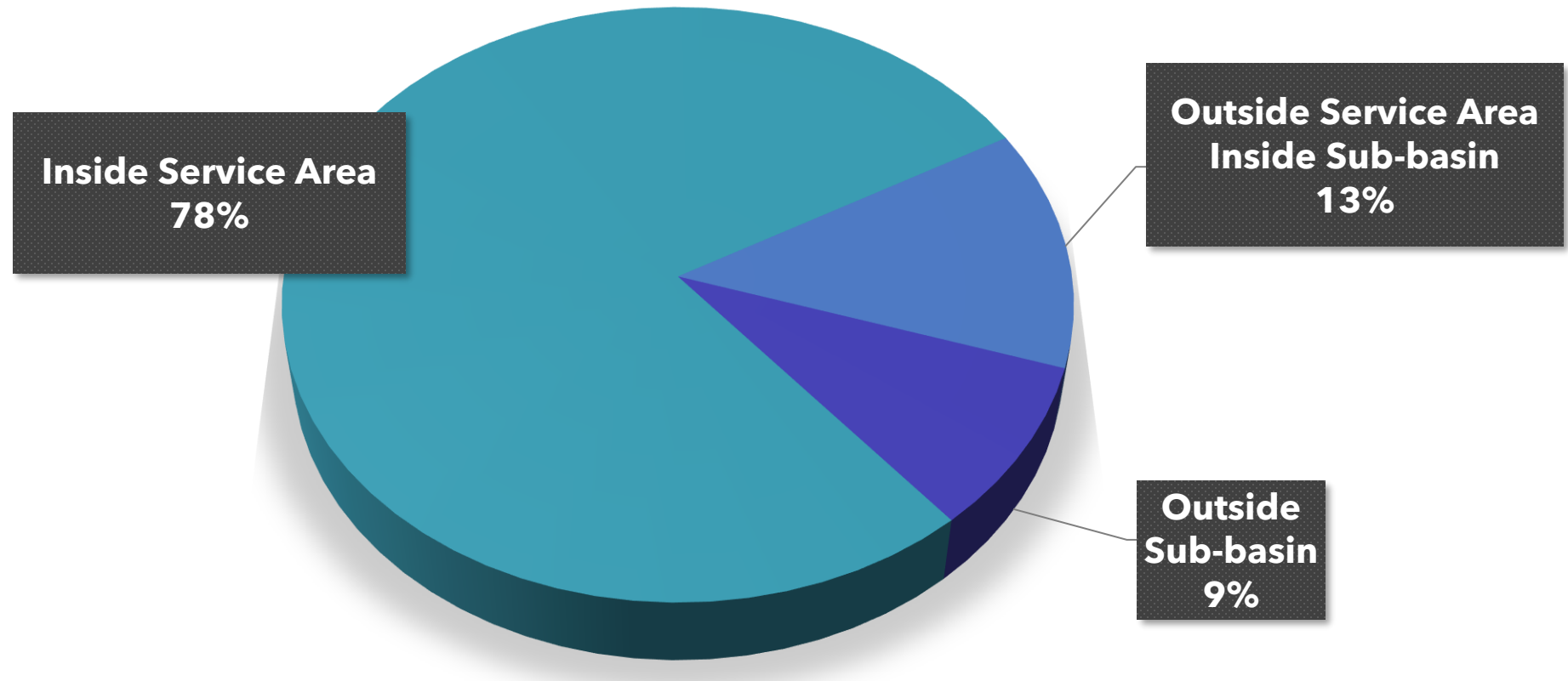


Part 2 – Hydrologic Disconnect

Municipal Providers

2.82M LTSC held by
Phoenix AMA
Municipal Providers

Distribution of Muni LTSC

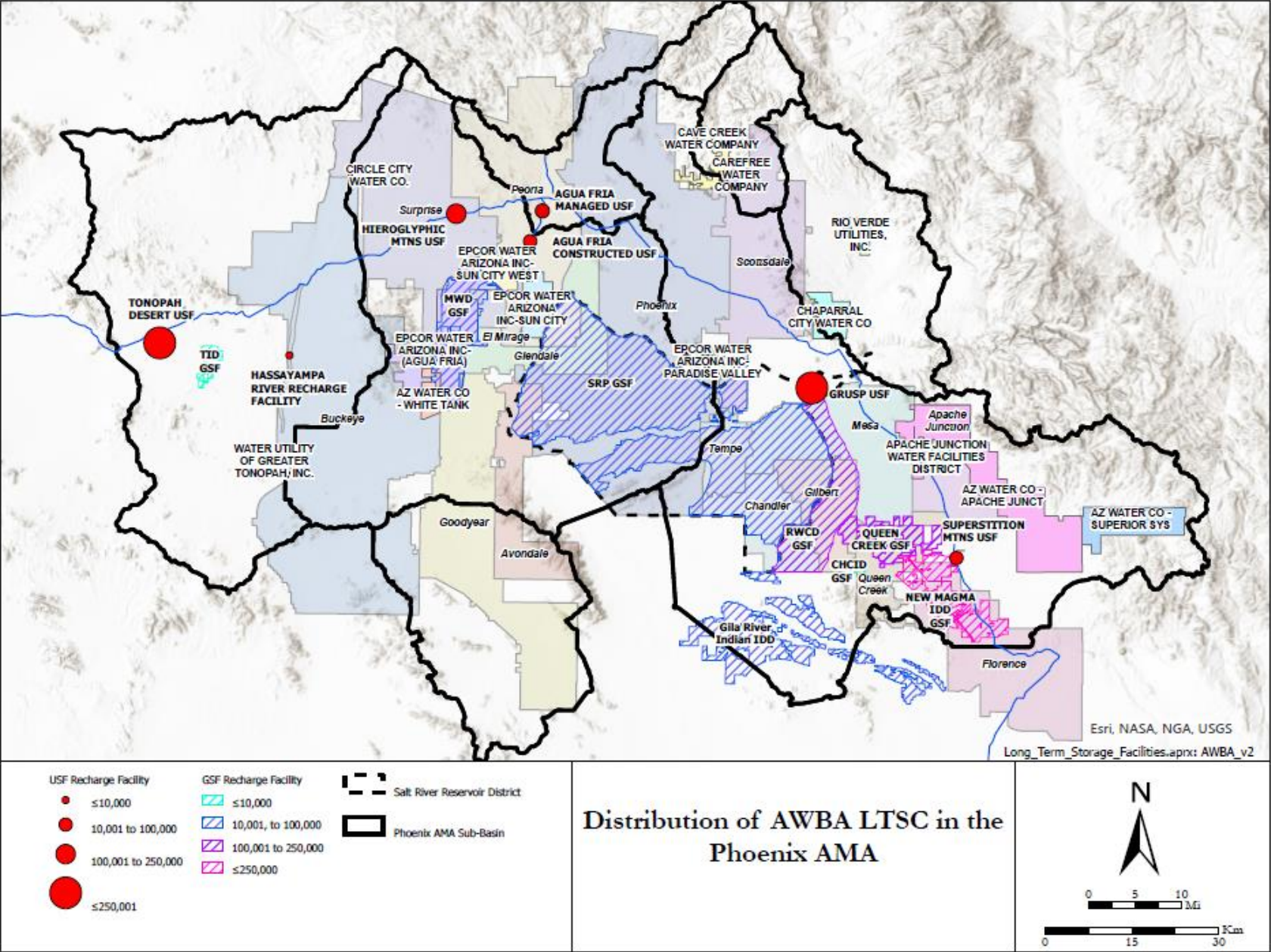


Part 2 – Hydrologic Disconnect

AWBA

1.98MAF

Distribution of AWBA LTSC
in Phoenix AMA in relation
to beneficiaries of those
LTSC



Part 2 – Hydrologic Disconnect Other Entities

1.40M LTSC held by 57 non-Municipal entities – about 23% of Phoenix AMA LTSC for future recovery

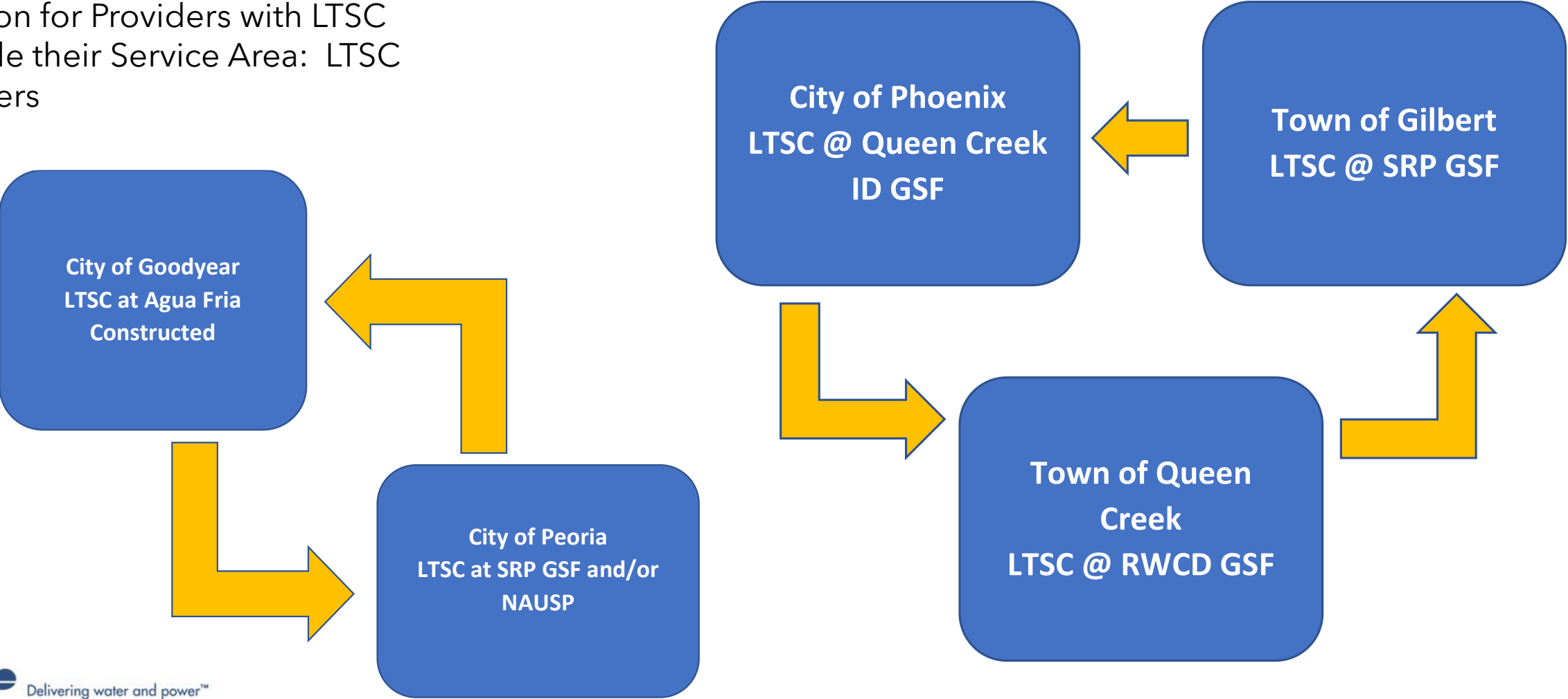
Of that volume, 83% is held by six entities:

LTSC Distribution by Sub-basin for Selected Top Entities in Phoenix AMA

LTSA Holder	Total (AF)	LTSC Distribution by Sub-basin (AF)			
		ESRV	WSRV	Hassayampa	Lake Pleasant
GRWS + GRIC	414,072	309,154	104,917		
Tohono O’Odham Nation of Arizona	266,413	172,900	72,534		20,979
Resolution Copper	256,356	237,811		18,544	
Freeport	128,777	118,239	10,538		
Salt River Project	102,159	99,728	2,431		
Total (AF)	1,167,777	937,832	190,420	18,544	20,979

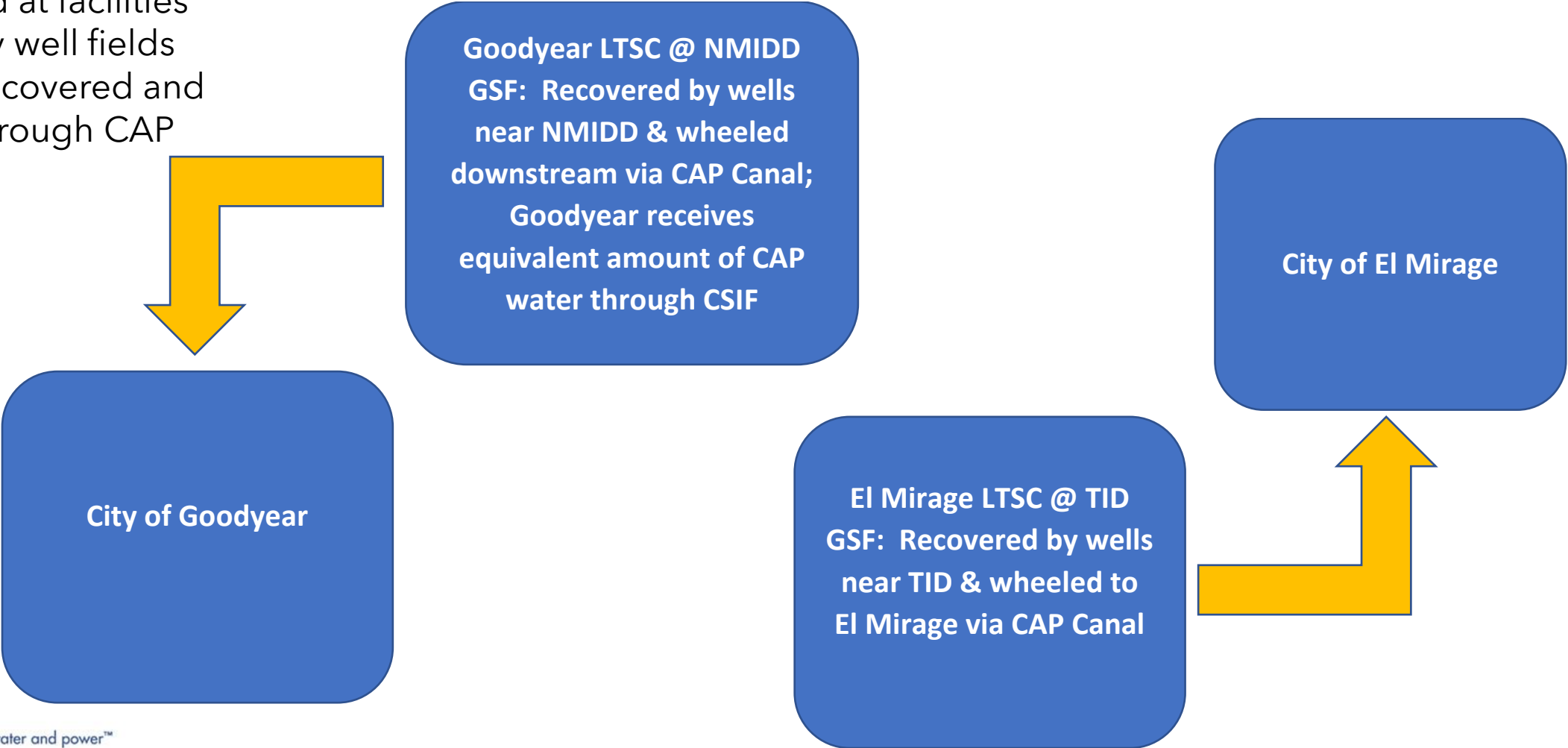
Part 3 – Potential Solutions - Trading Credits

The easiest and least expensive solution for Providers with LTSC outside their Service Area: LTSC transfers



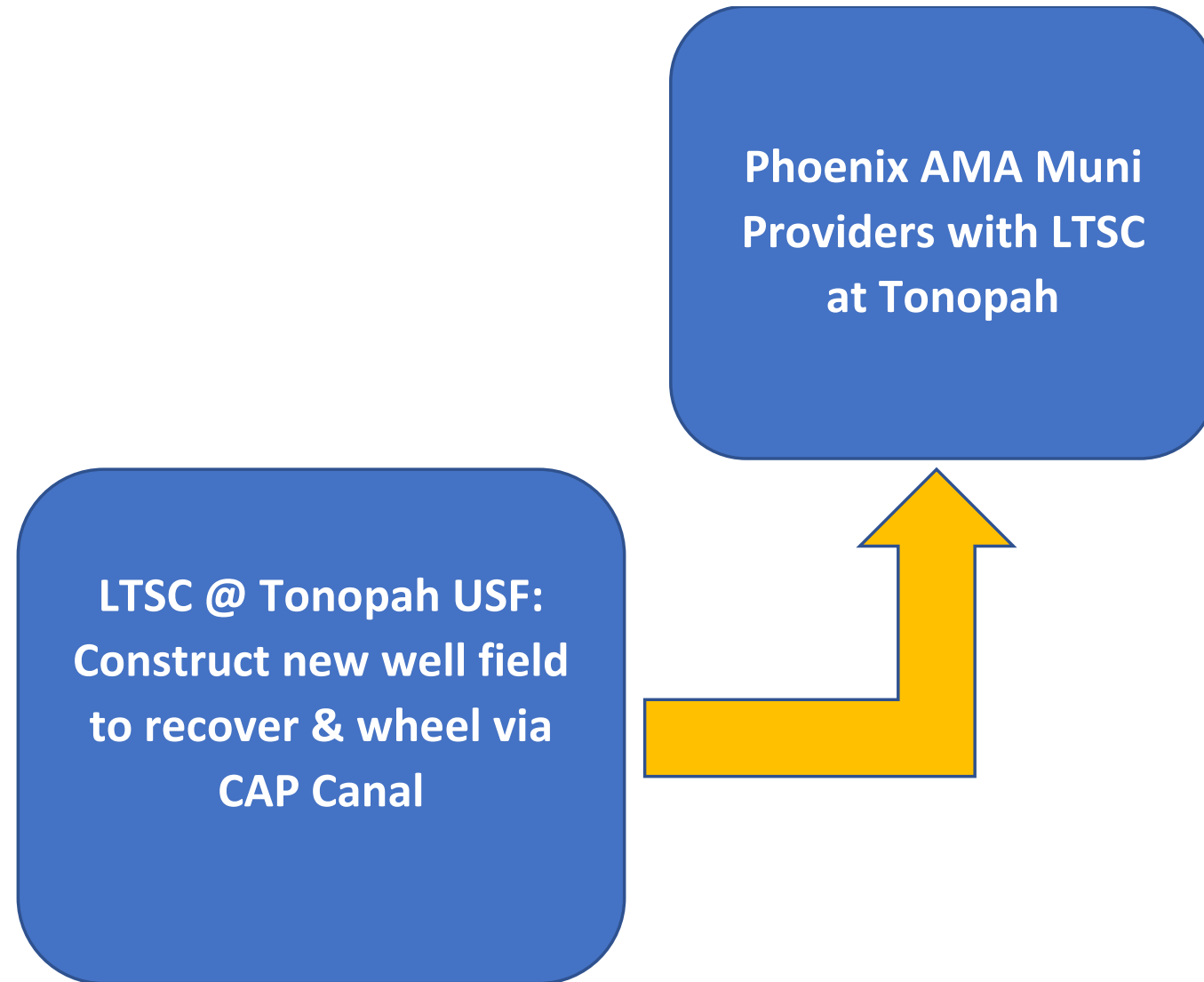
Part 3 – Potential Solutions – CAP Wheeling w/Existing Wells

LTSC stored at facilities with nearby well fields could be recovered and wheeled through CAP Canal



Part 3 – Potential Solutions – CAP Wheeling w/New Wells

New well fields could be constructed near facilities like Tonopah & Hieroglyphics to recover LTSC and wheel them via CAP Canal



Hydrologic Disconnect Bottom Line

- Hydrologic disconnect can only be quantified when likely recovery location is known
- For municipal providers, of 2.82 MAF of LTSC in storage
 - 621,595 AF (22%) located outside of the service area
 - Of those only 253,510 AF are located outside of the same subbasin (equals 9% of the total)
- Of the credits located outside of the service area
 - 69,452 AF can be traded to a location inside of the service area
 - 301,836 AF can be recovered from existing wells adjacent to the CAP canal
 - 237,608 AF need new wells and other infrastructure for recovery (stored at Tonopah Desert, TID, and Hieroglyphic Mt.)



CAGRD Obligation and Replenishment- Relationship to Hydrologic Disconnect

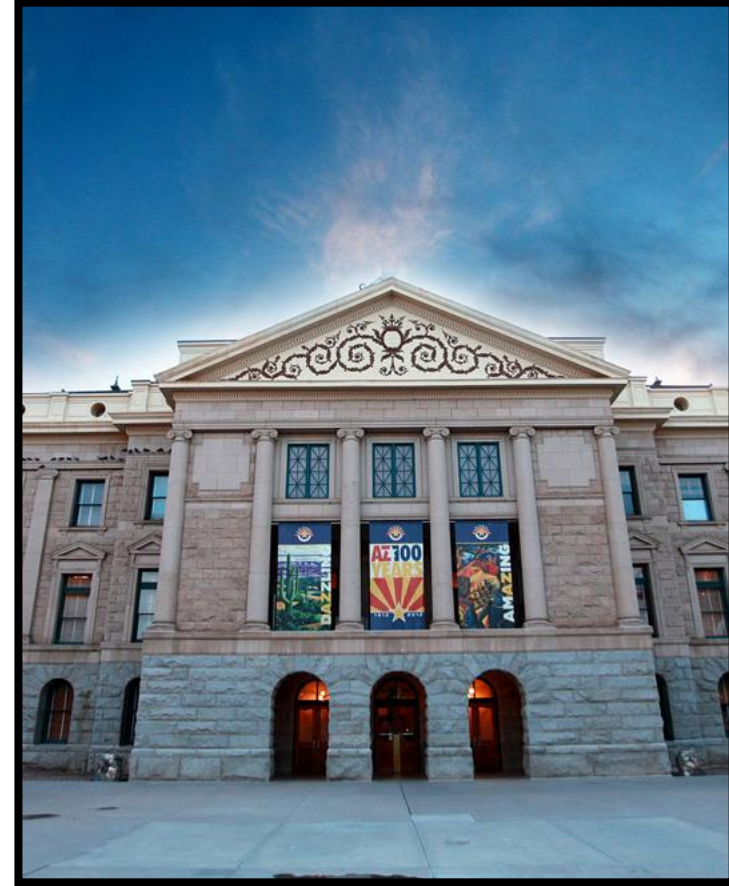
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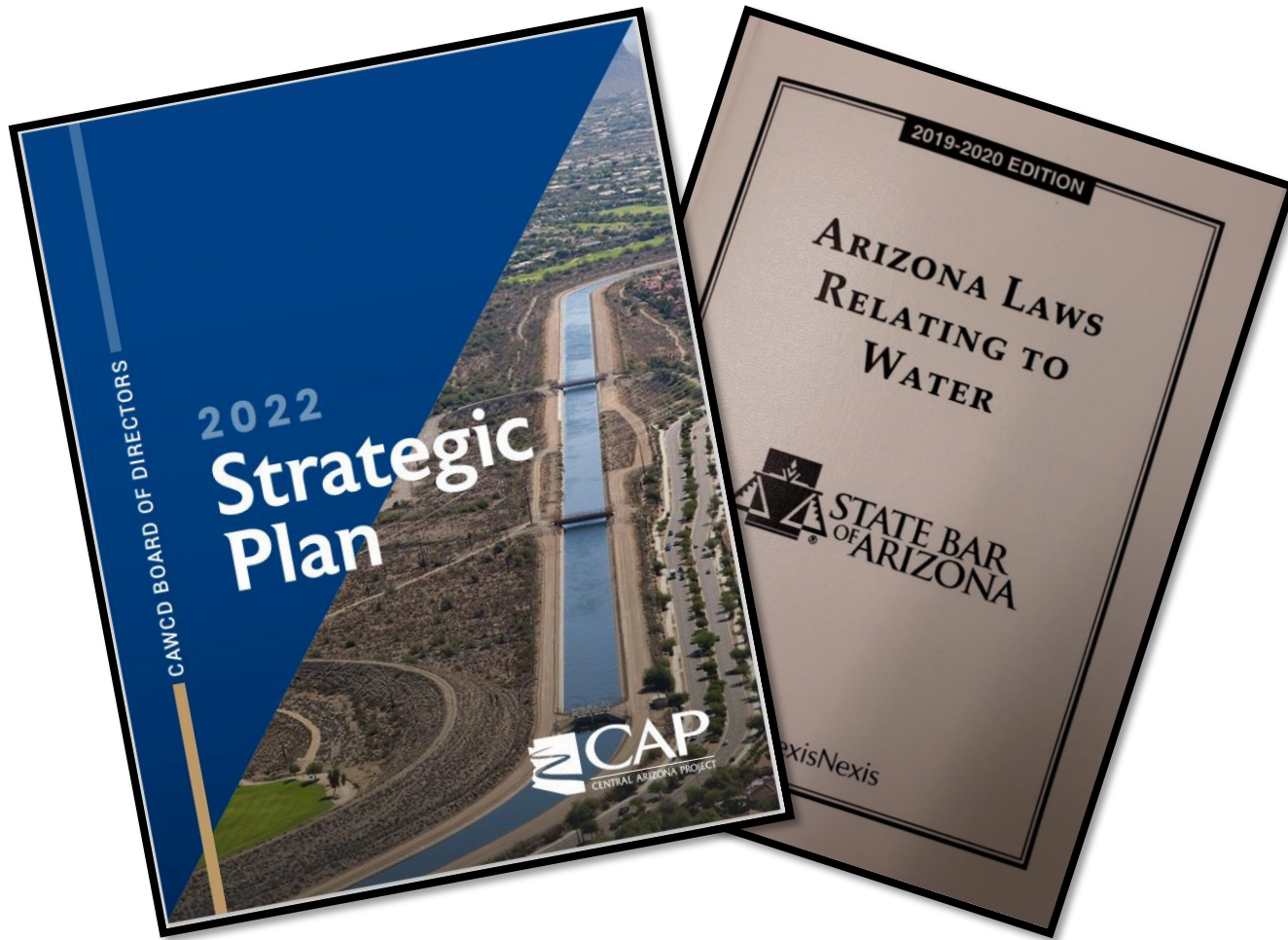
YOUR WATER. YOUR FUTURE.

CAGRD Background

- **Central Arizona Groundwater Replenishment District (CAGRD)** made possible by Arizona State Legislature in 1993
- Members may enroll in the CAGRD as Member Service Area water providers or as individual Member Land subdivisions
- CAGRD plays an important role in Arizona's groundwater management by replenishing excess groundwater pumped by its members



Statute and Guidance on Replenishment



KRA: Groundwater Replenishment

Fulfilling CAP's groundwater replenishment responsibilities in accordance with statutory requirements

Strategic Issues:

- Responsibly meet CAP's statutory replenishment obligation
- Participate actively in dialogues regarding the resilience and long-term role of the Central Arizona Groundwater Replenishment District (CAGRD)
- Consider the hydrologic relationship between member pumping and CAGRD replenishment
- Ensure continued effective management, reasonable pricing, and financial viability of CAGRD
- Enhance public outreach and education regarding the importance of water conservation and groundwater replenishment



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What is Hydrologic Disconnect?

Spatial separation from where water is stored and where it is removed

- Recharge and Recovery
- Pumping and Replenishment

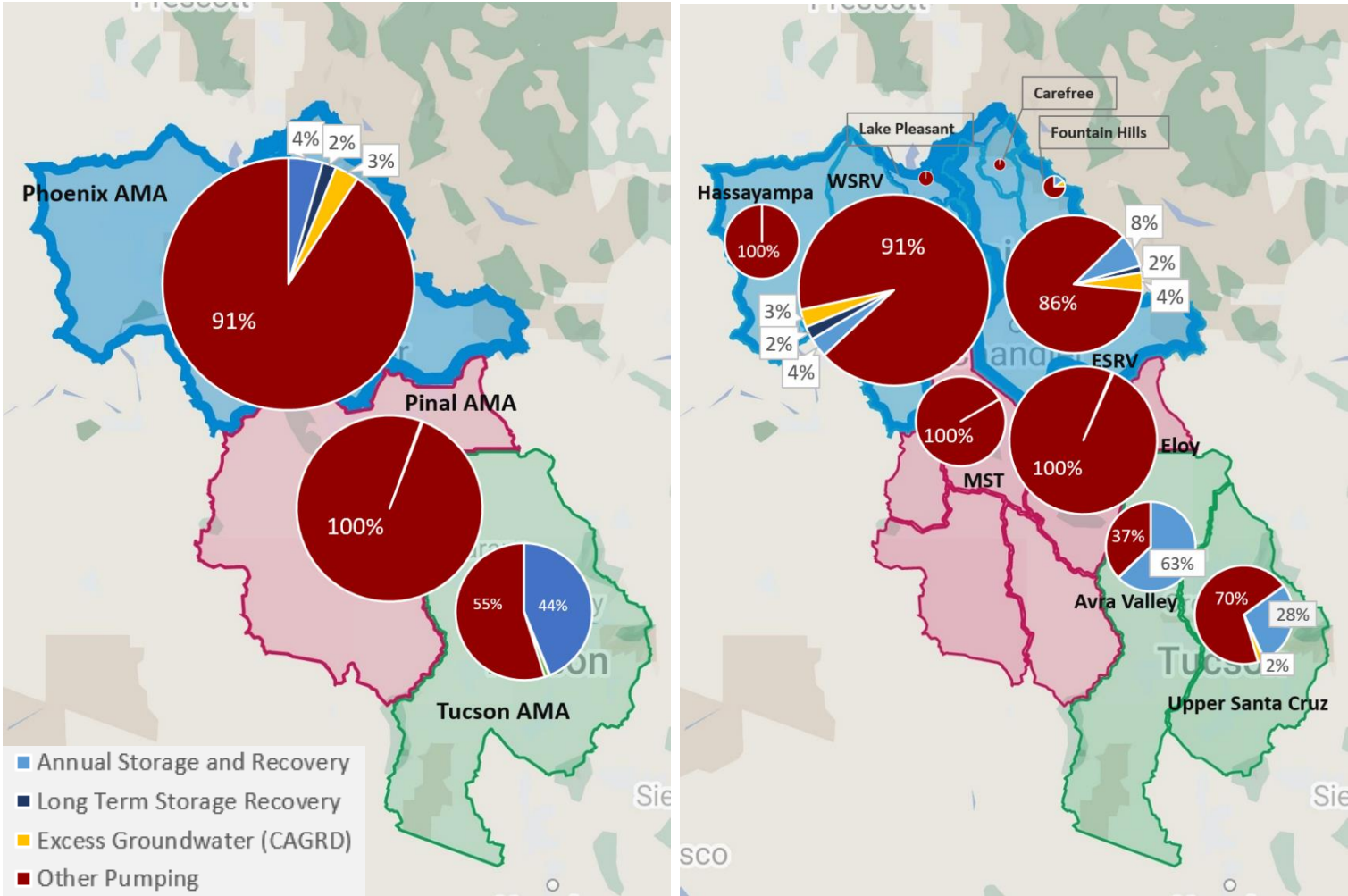
“... Anyone holding long-term storage credits may recover stored water from anywhere within the same Active Management Area (AMA) in which it was stored...”

-ADWR page on underground water storage, savings and replenishment

However:

- Recovery well siting rules – favor locations with stable water levels/within area of impact
- Limits on excessive drawdown resulting from stored water recovery
- “To the extent feasible, replenish in areas of hydrologic impact ” – Guidance on replenishment from CAWCD Board 2016 Strategic Plan

Pumping by AMA and Subbasin



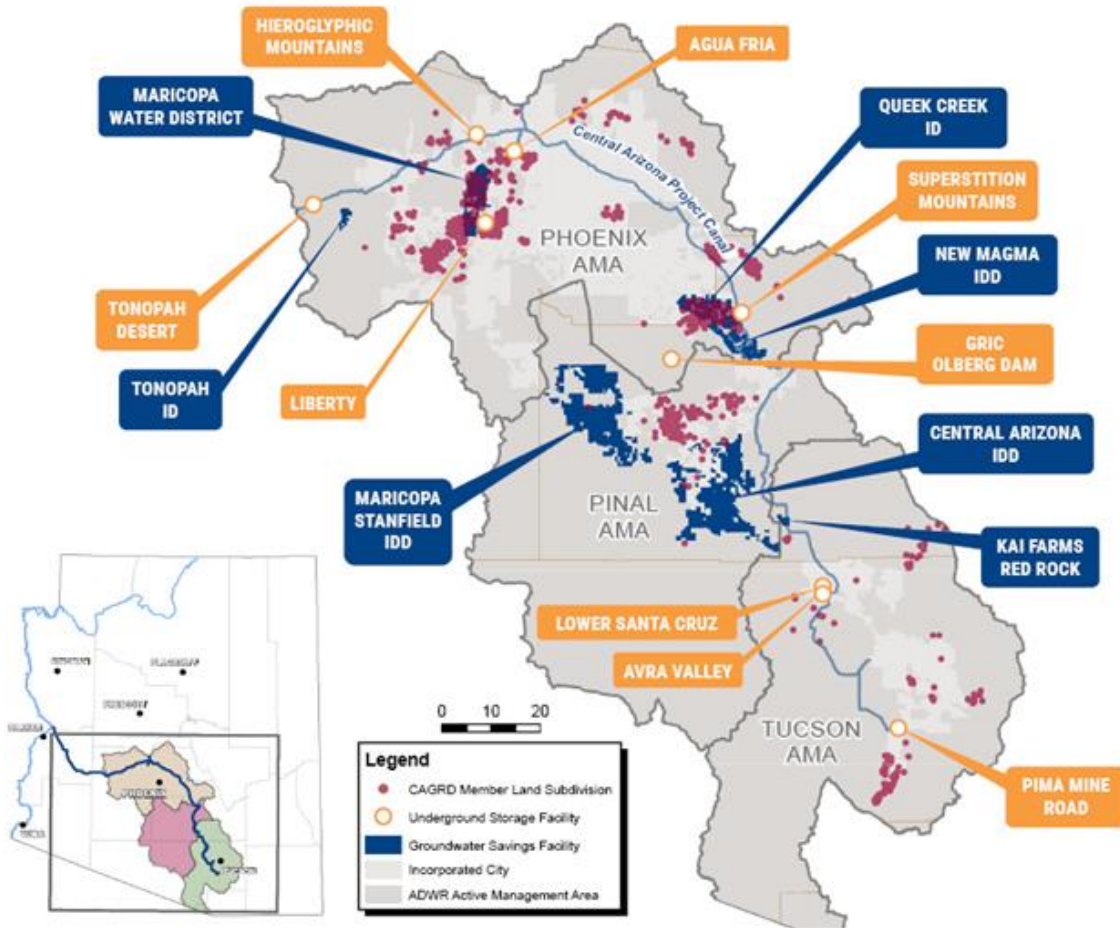
Withdrawals by Type Across the AMAs

AMA	Volume Pumped in 2018 (AF)
Phoenix AMA	836,000
ASR	37,000
LTSC Recovery	15,000
Excess GW (CAGRD)	26,000
Other Pumping	759,000
Pinal AMA	442,000
ASR	<1,000
LTS Recovery	<1,000
Excess GW (CAGRD)	<1,000
Other Pumping	446,000
Tucson AMA	230,000
ASR	101,000
LTS Recovery	<1,000
Excess GW (CAGRD)	3,000
Other Pumping	127,000



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Pumping and Replenishment



West Phoenix AMA	East Phoenix AMA
Agua Fria RP Hieroglyphic Mountains RP Liberty Utilities Facilities Maricopa Water District (GSF) Tonopah Desert RP Tonopah ID (GSF)	Gold Canyon RP New Magma IDD (GSF) Queen Creek ID (GSF) Superstition Mountains RP
Tucson AMA	Pinal AMA
Avra Valley RP BKW Farms (GSF) Kai Farms (GSF) Lower Santa Cruz RP Pima Mine Road RP	Central Arizona IDD (GSF) Maricopa-Stanfield IDD (GSF)

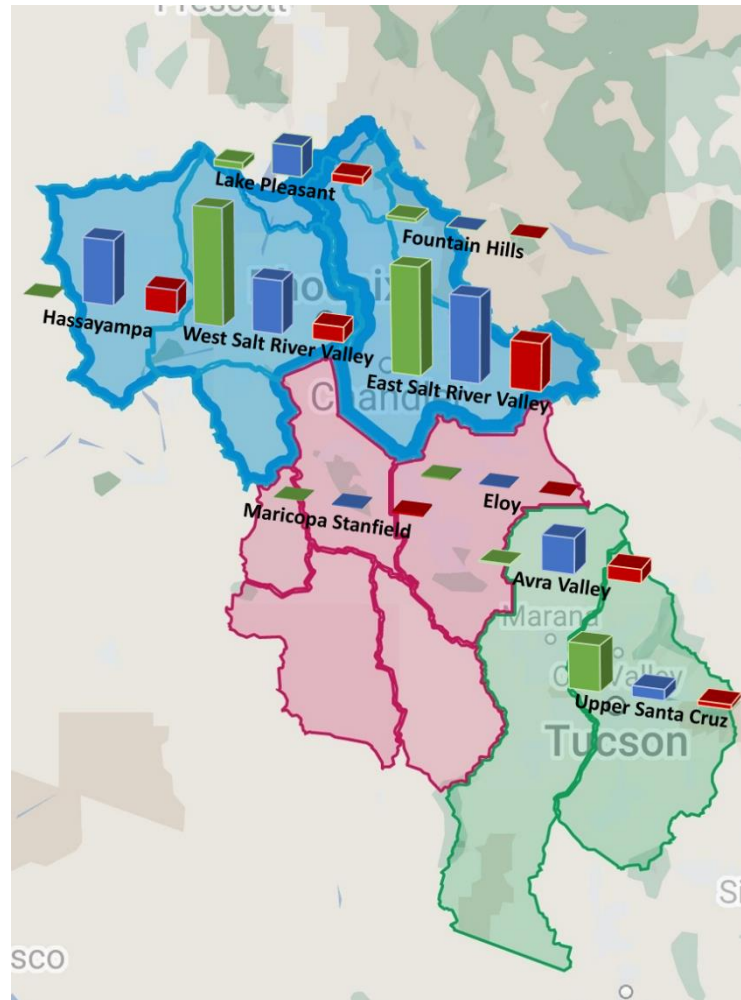
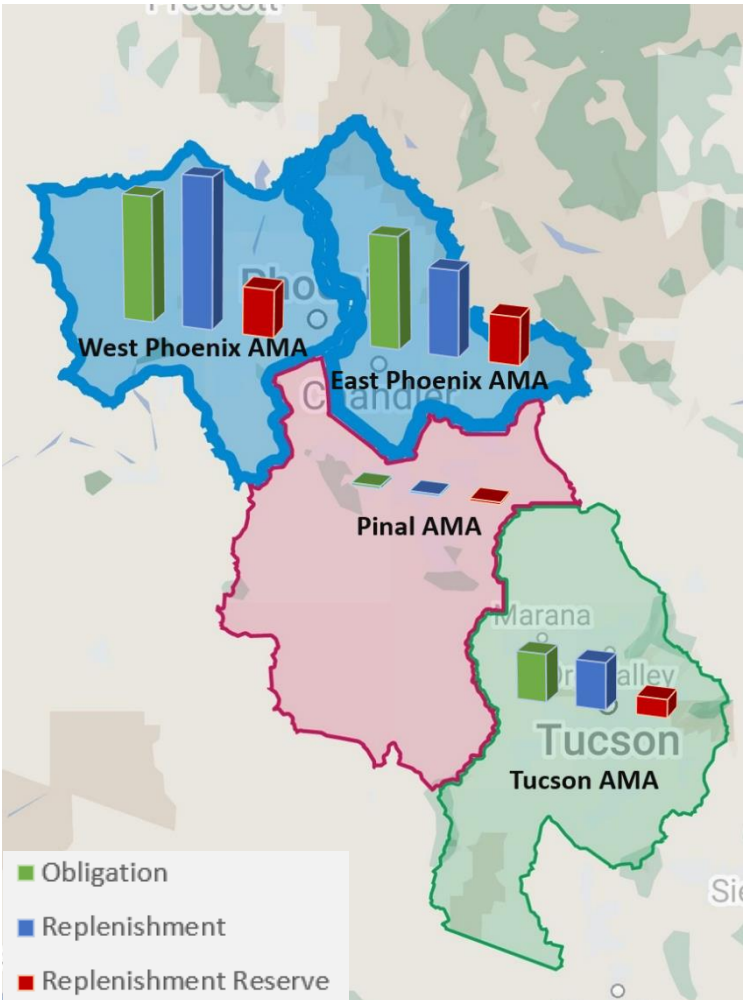


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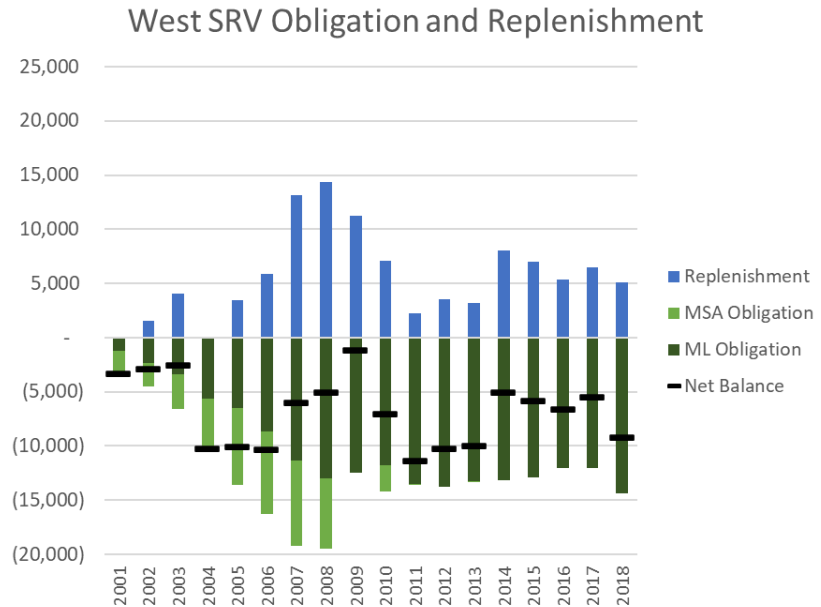
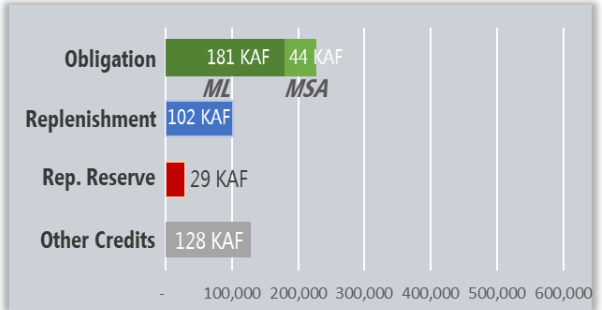
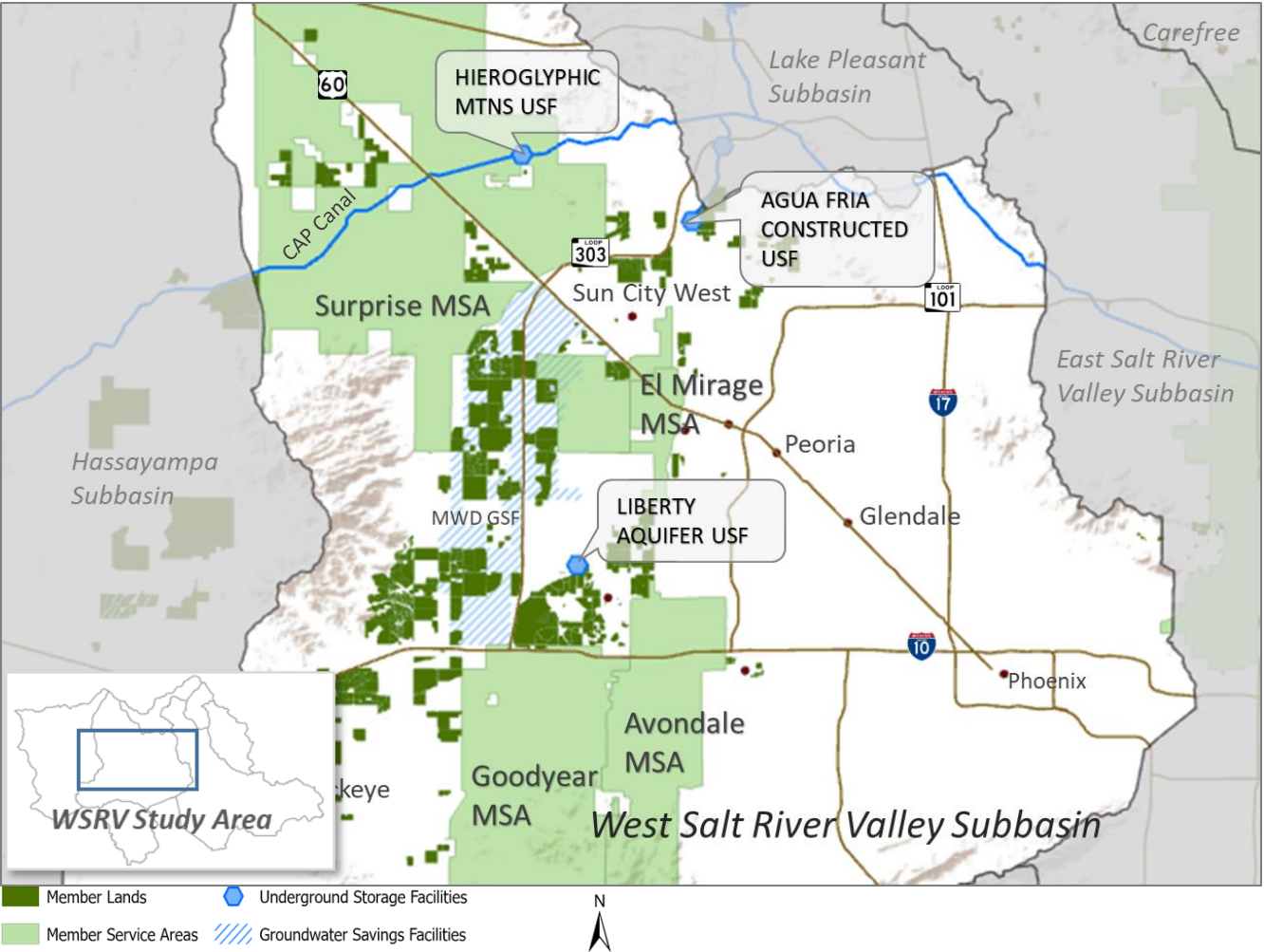
CAGRD Obligation and Replenishment Activity

Obligation and Replenishment in Thousands of Acre-Feet (KAF), 2001-2018

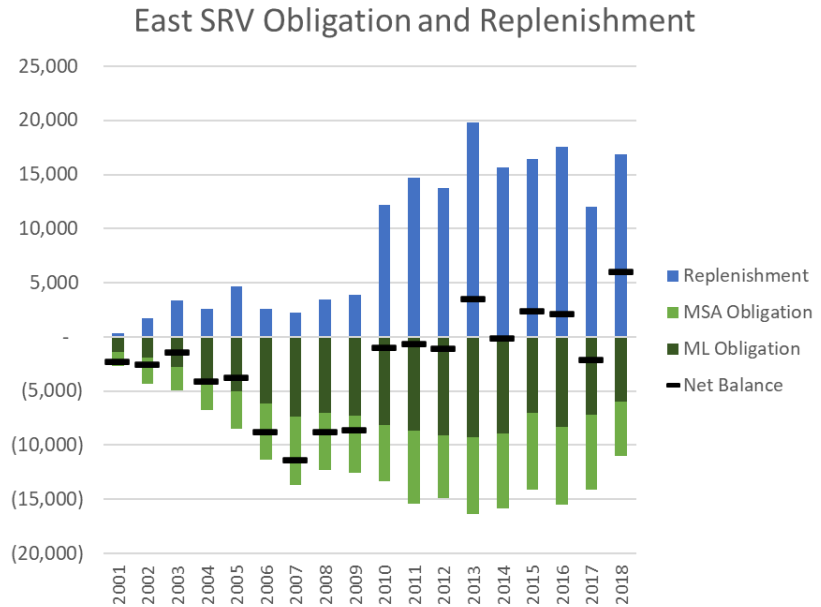
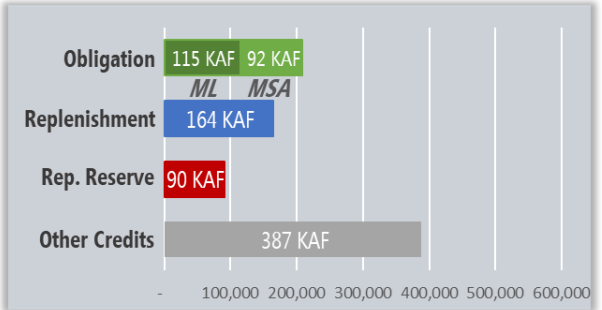
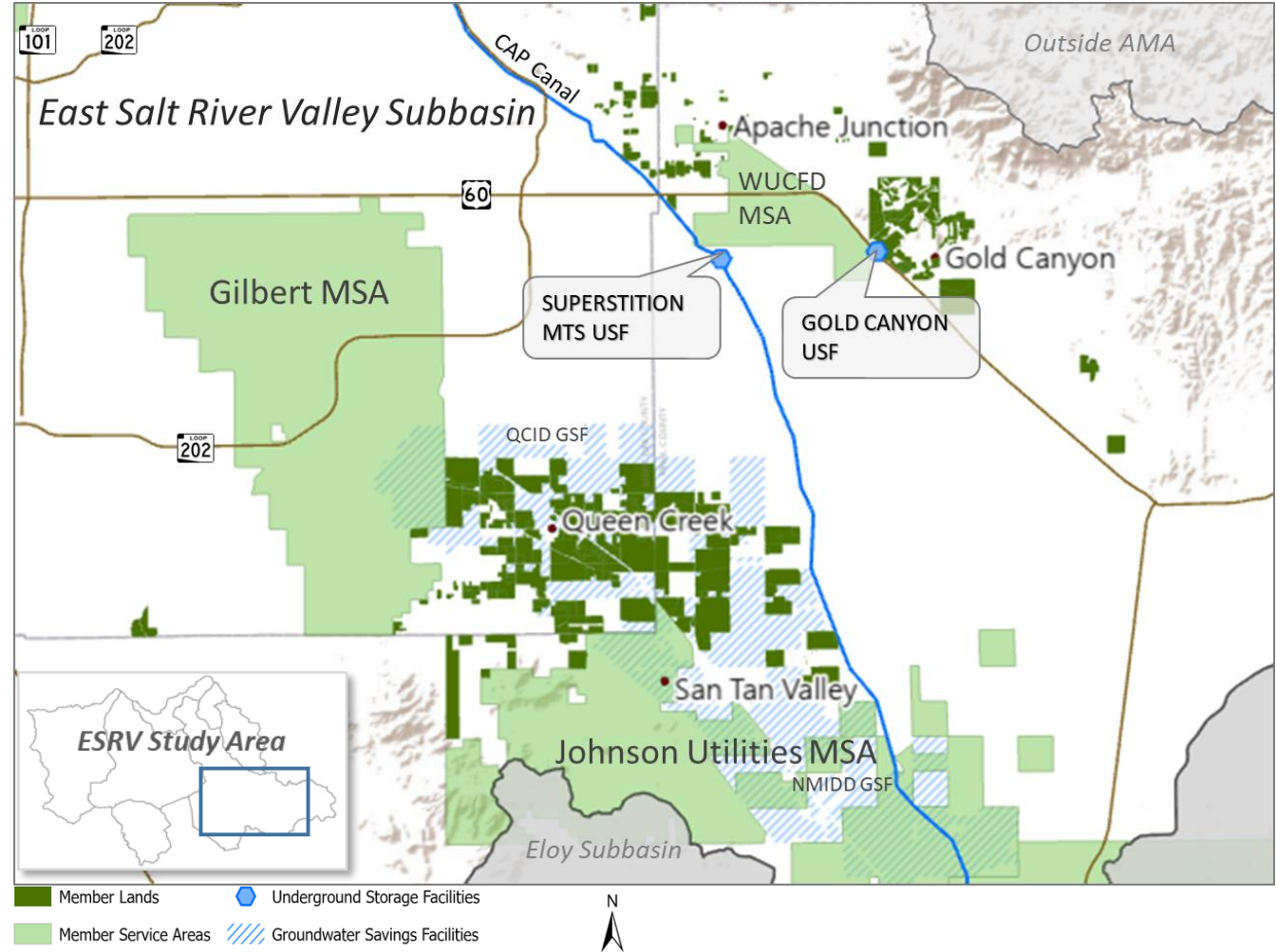
Subbasin	Obligation	Replenishment	Balance	RR	Other Credits
Hassayampa	-	123.5	123.5	44.8	38.3
WSRV	225.3	101.6	(-123.7)	30.00	127.9
ESRV	207.6	163.8	(-43.8)	90.4	387.1
Lake Pleasant	12.9	58.9	46	16.9	-
Fountain Hills	7.4	-	(-7.4)	-	-
Maricopa-Stanfield	1.5	2.4	0.9	3.8	379.8
Eloy	3.4	1.4	(-2.0)	1.1	309.5
Avra Valley	2.9	68.5	65.6	29.6	118.4
Upper Santa Cruz	89.5	20.9	(-68.6)	8.1	12.7



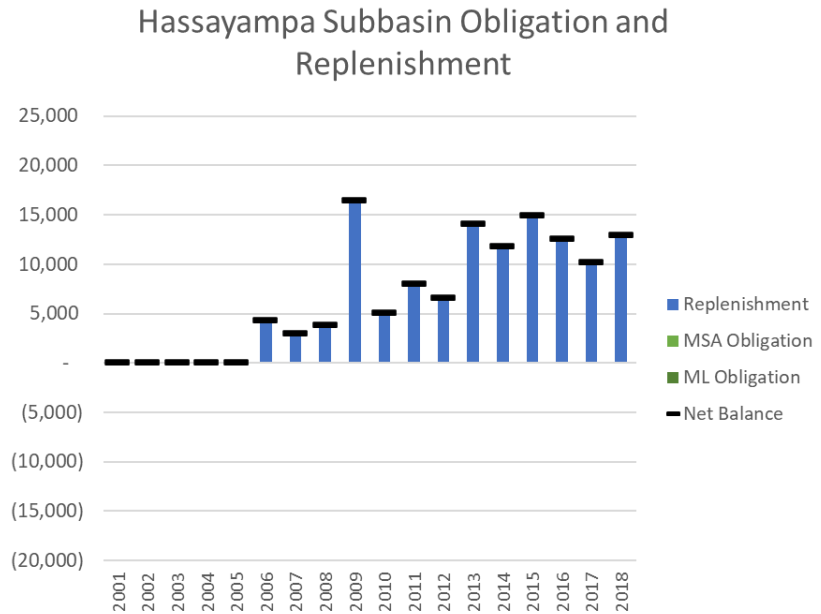
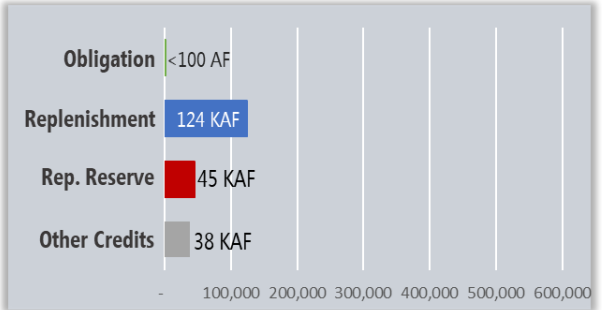
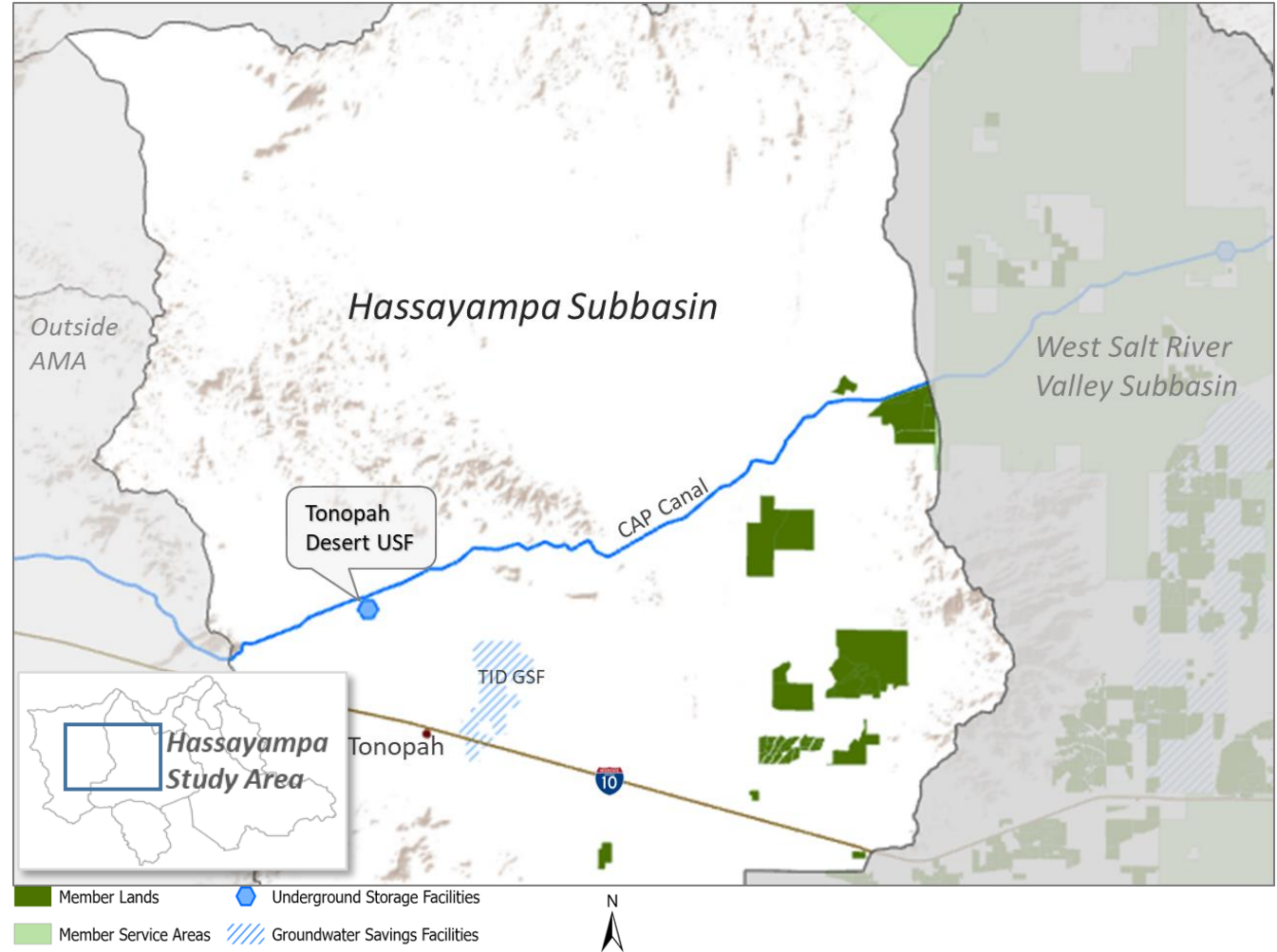
CAGRD Activity- West Salt River Valley Subbasin



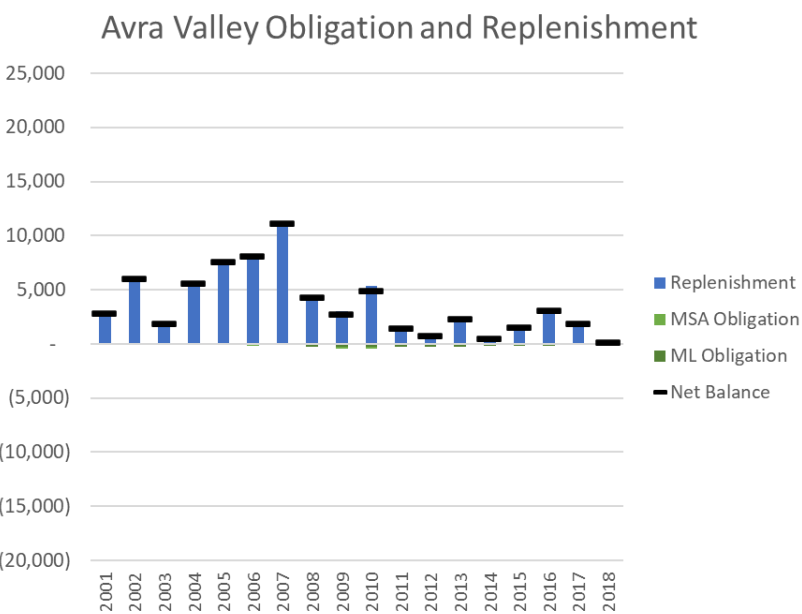
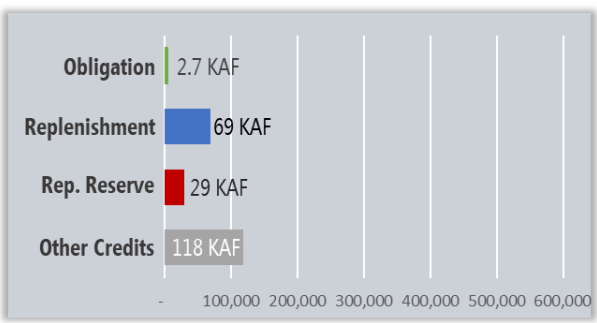
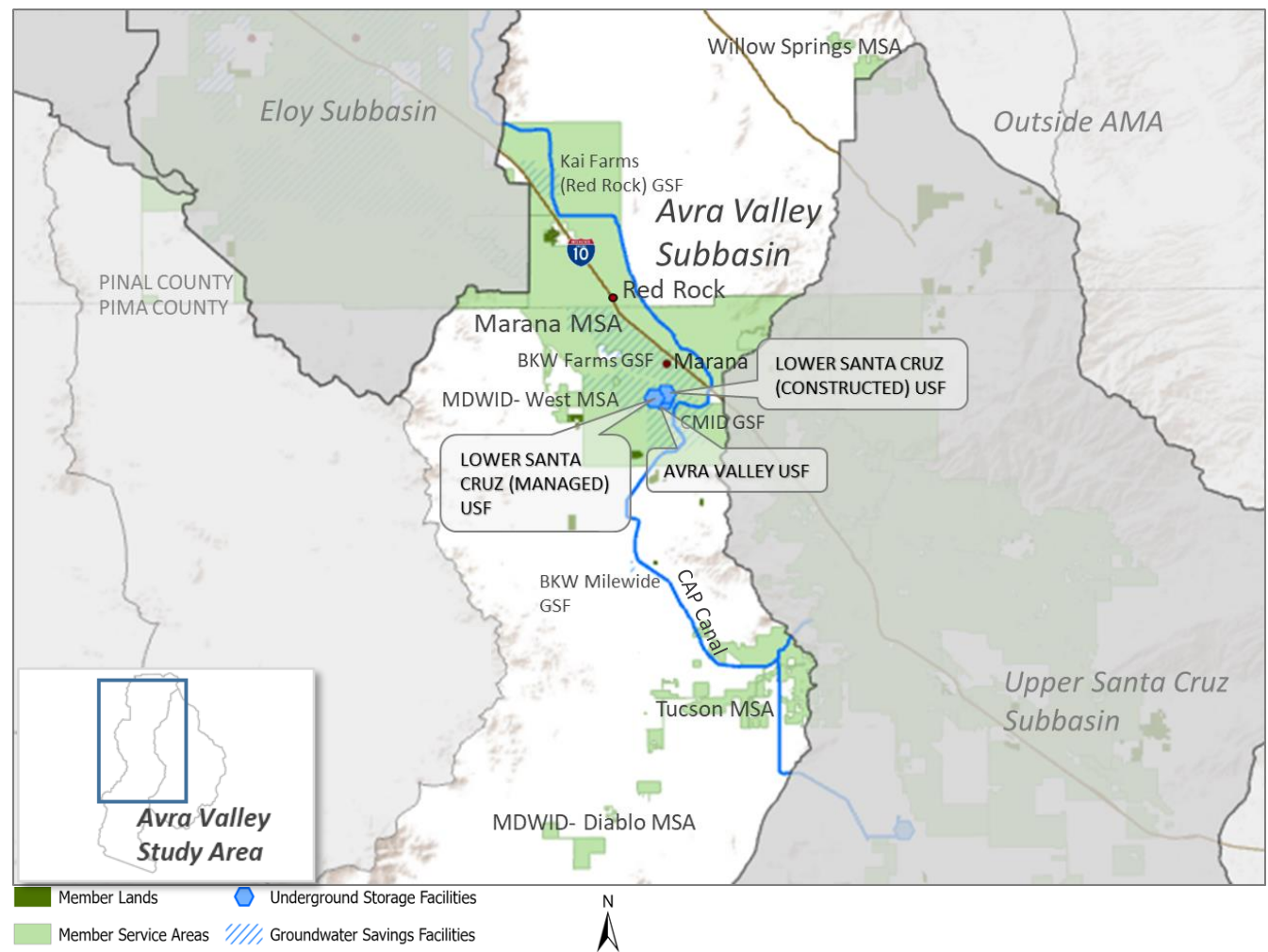
CAGRD Activity- East Salt River Valley Subbasin



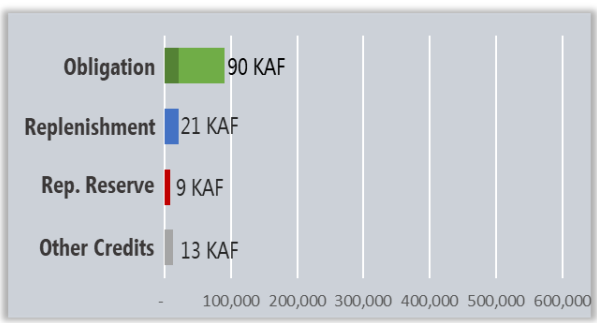
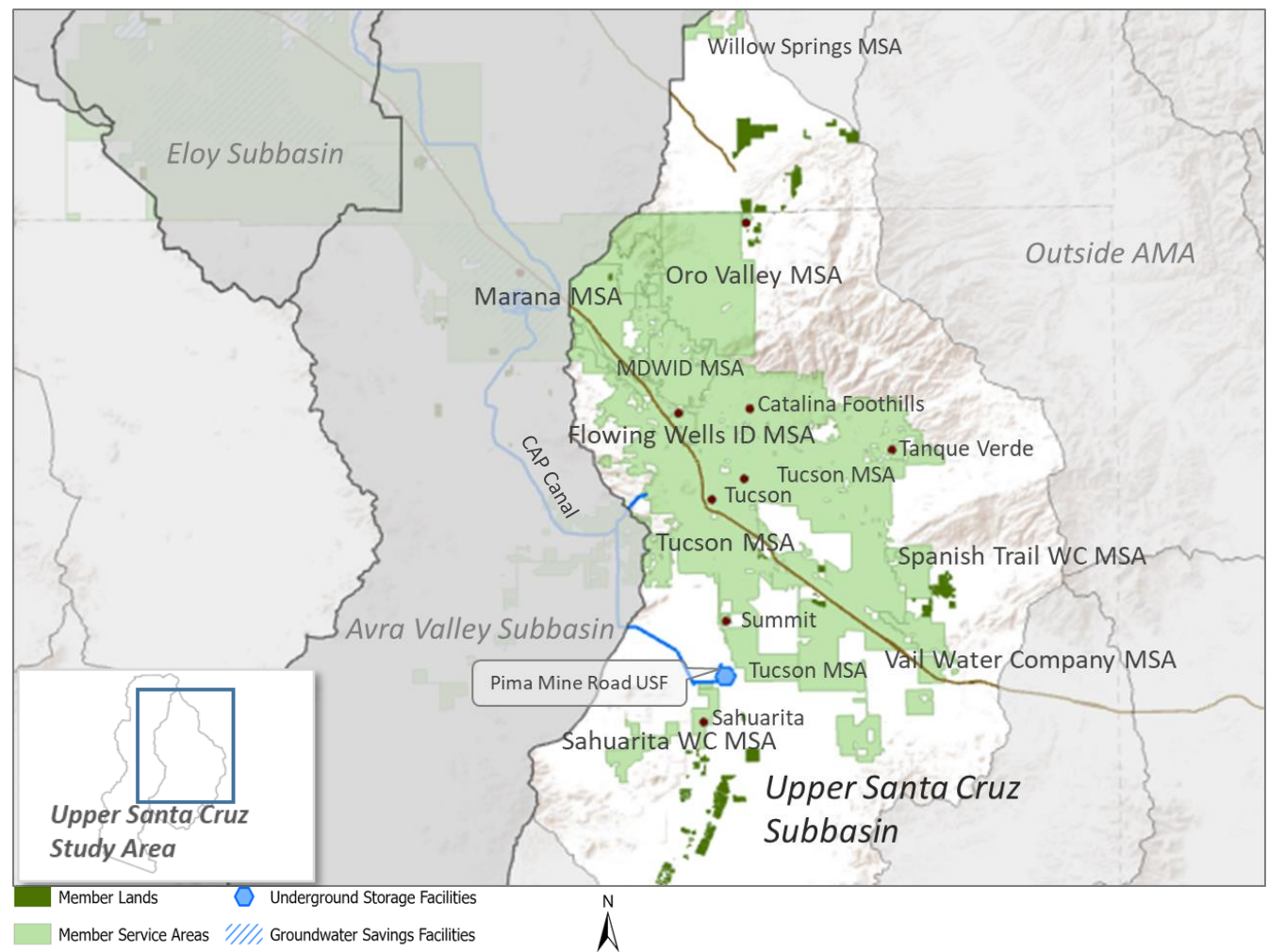
CAGRD Activity- Hassayampa Subbasin



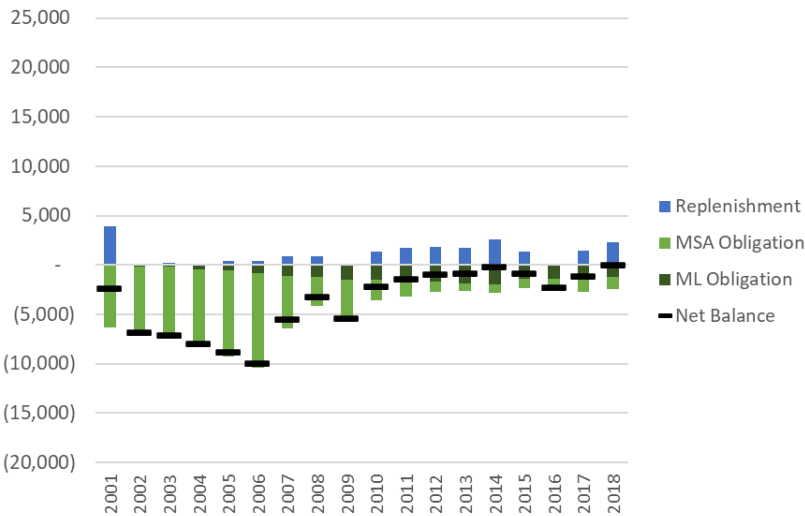
CAGRD Activity- Avra Valley Subbasin



CAGRD Activity- Upper Santa Cruz Subbasin



Upper Santa Cruz Subbasin Obligation and Replenishment





Thank You Questions?

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Discussion